

# MITCHELL FREEWAY STAGE 1

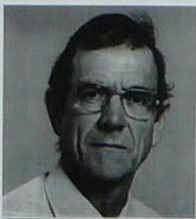
The Mitchell Freeway began as part of the Stephenson Metropolitan Region Scheme in the mid 1950s. Stage 1 included the Narrows Interchange, the Central Section between Mount and Murray Streets, and the Hamilton Interchange. Construction commenced in 1966 and was completed in 1973.



The Narrows Interchange site ca 1956

## Foundation Problems of the Narrows Interchange Site

The most difficult part of Mitchell Freeway Stage 1 to design and construct was the Narrows Interchange. Soon after the Narrows Bridge was completed in 1959 Main Roads WA started planning for the preparation of the interchange site for road and bridge construction, Mounts Bay having been previously reclaimed by dredging. In 1961 Main Roads Chief Bridge Engineer Gilbert Marsh spent twelve months in the UK where he investigated techniques which could be used for the rapid consolidation of the mud layers under the future Narrows Interchange site. On his return to Perth he initiated a successful pilot program of sand draining techniques after which, commencing in 1964, Main Roads carried out, over a four year period, an extensive stabilisation of a 37 hectare reclaimed area north of the Narrows Bridge. This was done by the installation of 43,000 vertical sand drains, about 800 km in length. In addition approximately three million cubic metres of sand was trucked in to consolidate the mud by forcing water to come to the surface through the sand drains. The scale of this stabilisation process was unique in Australian, and probably in the world, civil engineering construction at the time.



J.G. (Gilbert) Marsh BE FIEALST  
Bridge Engineer Main Roads WA - 1957 to 1985



D.H. (Don) Aitken BE FIEALST AO  
Commissioner of Main Roads WA - 1965 to 1987

## The Central Section

The central section was designed by De Leuw Cather of Chicago, a firm which had specific expertise in geometric road design, with selected Main Roads staff as part of the design team. The project scope consisted of bridges over Malcolm, Hay and Murray streets, retaining walls, freeway standard roadway pavements and connections to adjoining streets. A contract to construct the section was let in March 1966 to Clough Kier, a Joint Venture between Perth firm Clough Engineering and Kier Ltd, a UK based company. Work was completed in 1968.



Commemorative Plaque - unveiled 1982

On 18 November 1966 the Premier of Western Australia, the Hon David Brand, M.L.A., pulled a lever to begin the first concrete pour on the Central Section. The above plaque is fixed on the north retaining wall of Murray Street Bridge, and was unveiled by Lady Brand, widow of Sir David Brand, on 18 November 1982.

## Hamilton Interchange

Connecting to the northern end of the Central Section the Hamilton Interchange consisted of bridges over Wellington, Market, Roe Streets and the Perth to Fremantle railway. It was constructed by P.D.C. Pty Ltd between 1969 and 1972.

## The Barracks Arch

The commencement in 1965 of the demolition of buildings west of the Perth CBD to make way for the central section of the freeway caused a public outcry when it was realised that the colonial era Barracks was to be removed. A compromise was reached whereby the arch gateway was preserved. The Barracks Arch stands as a symbol of an increased awareness of the value of preserving the built heritage in Western Australia.



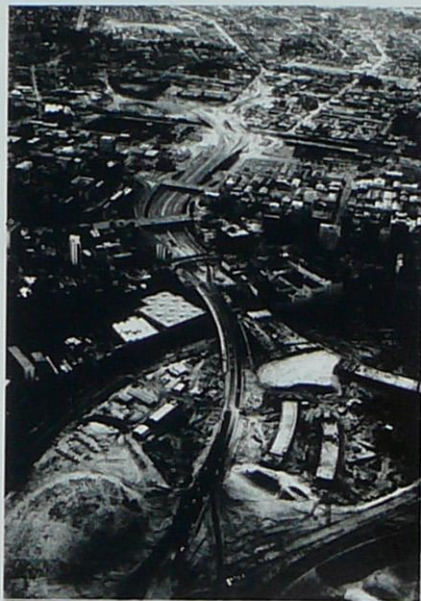
Barracks Arch and Malcolm Street Bridge over central section of freeway



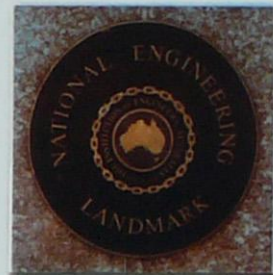
Photo of the model of a Narrows Interchange bridge showing caisson foundations

## The Narrows Interchange Bridges

The Narrows Interchange roads and bridges were designed by Main Roads staff. Despite the success of the foundation consolidation by sand draining and surcharge it was anticipated that there would be further vertical and horizontal subsurface movements in the region of the bridges' foundations. As a consequence the bridges are supported on concrete piers contained within larger diameter watertight concrete cylinders (caissons). The caissons were built in stages and sunk to bedrock by excavating the soil within. The bridge support piers were then constructed. The annular space between the piers and the caisson walls prevents future ground movements from affecting the piers. The Narrows Interchange bridges were constructed by Citra Australia from 1969 to 1973.



The Narrows Interchange under construction, July 1972.  
Beyond is the Central Section and the Hamilton Interchange



The Mitchell Freeway Stage 1 was declared a National Engineering Landmark by Engineering Heritage Australia (the heritage arm of Engineers Australia) at a heritage recognition ceremony held on 18 November 2008.

This award recognises Engineering Heritage Australia's assessment that this work of engineering is of national significance to the people of Australia



Narrows Interchange 2008